

SEQUENCE LISTING

<110> Breitling, Frank
<120> SELECTION OF MONOCLONAL ANTIBODIES
<130> 4121-126
<140> US 09/889,182
<141> 2000-01-11
<150> PCT/DE00/00079
<151> 2000-01-11
<160> 6
<170> PatentIn version 3.1
<210> 1
<211> 5732
<212> DNA
<213> Artificial Sequence
<220>
<223> Synthetic sequence
<400> 1
gcgcgcgttg acattgatta ttgactagtt attaatagta atcaattacg gggtcattag 60
ttcatagccc atatatggag ttccgcgtta cataacttac ggttaatggc ccgcctggct 120
gaccgccaa cgaccccgcc 223> ccattgacgt caataatgac gtatgttccc atagtaacgc 180
caataggac tttccattga cgtcaatggg tggactatTT acggtaaact gcccacttgg 240
cagtacatca agtgtatcat atgccaagta cgcccccstat tgacgtcaat gacggtaaat 300
ggccgcctg gcattatgcc cagtacatga ctttatggga ctttcctact tggcagtaca 360
tctacgtatt agtcatcgct attaccatgg ttagtgcgtt ttggcagtac atcaatggc 420
gtggatagcg gtttgactca cggggatttc caagtctcca ccccattgac gtcaatggga 480
gtttgttttg gcaccaaaat caacggact ttccaaaatg tcgtaacaac tccgcggat 540
tgacgcataat gggcggttagg cgtgtacggg gggaggtcta tataaggcaga gctctctggc 600
taactagaga acccactgct tactggctta tcgaaattaa tacgactcac tataaggaga 660
cccaagcttg gtaccgagct cggatccact agtaacggcc gccagtgtc tggcgttcc 720
cttggggata tccaccatgg agacagacac actccctgcta tgggtactgc tgctctgggt 780
tccaggttcc actgggtact atccatatga tggccagat tatgctgggg cccaaaagcc 840
cgaggtgatc gatgccagcg agctgacccc cgccgtgacc acctacaagc tagtgatcaa 900
cggaagacc ctgaaggcg agaccaccac cgaggccgtg gacgcccaca ccgcggagaa 960
ggtgttcaaa caatacgcta atgacaacgg ggtgcacggc gagttgactt acgacgacgc 1020
caccaagacc ttcaccgtga ccgagaagcc cgaggtgatc gatgccagcg agctgacccc 1080
cgccgtgacc acctacaagc tagtgatcaa cgccaagacc ctgaaggcg agaccaccac 1140
cgaggccgtg gacgcccaca ccgcggagaa ggtgttcaaa caatacgcta atgacaacgg 1200
ggtgcacggc gagttgactt acgacgacgc caccaagacc ttcaccgtga ccgaggccgc 1260

cgcagaacaa aaactcatct cagaagagga tctgaatggg gccgtcgac gacaaaacga 1320
caccagccaa accagcagcc cctcagcatc cagcaacata agcggaggca tttcccttt 1380
cttcgtggcc aatgcataa tccaccttct ctgcttcagt tgaggtgaca cgtctagagc 1440
tattctatag tgtcacctaa atgctagagc tcgctgatca gcctcgactg tgcctctag 1500
ttgccagcca tctgttgtt gcccctcccc cgtgccttcc ttgaccctgg aaggtgccac 1560
tcccactgtc ctttccataat aaaatgagga aattgcatcg cattgtctga gttaggtgtca 1620
ttcttattctg ggggggtgggg tggggcagga cagcaagggg gaggattggg aagacaatag 1680
caggcatgct ggggatgcgg tgggctctat ggcttctgag gcggaaagaa ccagtggcg 1740
taatacggtt atccacagaa tcagggata acgcaggaaa gaacatgtga gcaaaaggcc 1800
agcaaaaggc caggaaccgt aaaaaggccg cggtgctggc gttttccat aggctccgccc 1860
ccctgacga gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac 1920
tataaagata ccaggcggtt cccctggaa gctccctcggt gcgctctcct gttccgaccc 1980
tgccgcttac cgatcacctg tccgccttcc tcccttcggg aagcgtggcg ctttccata 2040
gctcacgctg taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc 2100
acgaaccccc cgttcagccc gaccgctgcg ctttatccgg taactatcgat cttgagtcc 2160
accccgtaag acacgactta tcgcccactgg cagcagccac tggtaacagg attagcagag 2220
cgaggtatgt aggcgggtct acagagttct tgaagtgggt gcctaactac ggctacacta 2280
gaaggacagt atttggtatc tgcgctctgc tgaagccagt taccttcggg aaaagagttg 2340
gtagctcttg atccggcaaa caaaccacccg ctggtagcgg tggttttttt gtttgcac 2400
agcagattac ggcgcagaaaa aaaggatctc aagaagatcc tttgatctt tctacgggg 2460
ctgacgctca gtggAACGAA aactcacgtt aagggattttt ggtcatgaga ttatcaaaaa 2520
ggatcttcac ctagatcctt taaaattaaa aatgaagttt taaatcaatc taaagtatata 2580
atgagtaacc tgaggctatg gcagggcctg ccgccccgac gttggctgcg agccctggc 2640
cttcacccga acttgggggg tgggggtgggg aaaaggaaga aacgcggcg tattggcccc 2700
aatggggtct cgggtgggtta tcgacagagt gccagccctg ggaccgaacc ccgcgtttat 2760
gaacaaacga cccaaacacccg tgcgttttat tctgtctttt tattgcccgc atagcgcggg 2820
ttcccttcggg tattgtctcc ttccgtgtt cagttgcctt ccccttaggg tgggcgaaga 2880
actccagcat gagatccccg cgctggagga tcatccagcc ggcgtcccgaaaacgattc 2940
cgaagccaa ctttcatacg aaggcggcg tggaaatcgaa atctcgat ggcaggttgg 3000
gcgtcgctt gtcggtcatt tcgaacccca gagtcccgc tagaagaact cgtcaagaag 3060
gcgatagaag gcgatgcgt gcgaatcggg agcggcgata ccgtaaagca cgaggaaagcg 3120
gtcagcccat tcgcccggaa gctcttcagc aatatcacgg gtagccaaacg ctatgtccctg 3180
atagcggtcc gccacacccca gcccggccaca gtcgtgaat ccagaaaagc ggccattttc 3240
caccatgata ttccggcaagc aggcatcgcc atgggtcactg acgagatctt ccgcgtccgg 3300
catgctcgcc ttqagccctgg cqaaacagttc qactqqcqcq aqccctqat gctcttgatc 3360

atcctgatcg acaagaccgg cttccatccg agtacgtgct cgctcgatgc gatgtttcgc	3420
ttggtgttcg aatgggcagg tagccggatc aagcgtatgc agccgcccga ttgcatcagc	3480
catgatggat actttctcgg caggagcaag gtgagatgac aggagatcct gccccggcac	3540
ttcgccccat agcagccagt ccctccgc ttcagtgaca acgtcgagca cagctgcgca	3600
aggaacgccc gtcgtggcca gccacgatag ccgcgcgtcc tcgtcttgc gttcattcag	3660
ggcacccggac aggtcggtct tgacaaaaag aaccgggcgc ccctgcgctg acagccggaa	3720
cacggcggca tcagagcagc cgattgtctg ttgtcccag tcatagccga atagcctctc	3780
cacccaagcg gccggagaac ctgcgtgcaa tccatcttgt tcaatcatgc gaaacgatcc	3840
tcatcctgtc tcttgatcga tctttgcaaa agcttaggccc tccaaaaaaag cctccctact	3900
acttctggaa tagctcagag gccgaggagg cggcctcggc ctctgcataa ataaaaaaaaa	3960
ttagtcagcc atggggcggaa gaatgggcgg aactgggcgg agttagggc gggatggcgc	4020
gagtttagggg cgggactatg gttgctgact aatttggatg catgcttgc atacttctgc	4080
ctgctggggac gcctggggac tttccacacc tgggtgctga ctaattgaga tgcattgc	4140
gcataacttct gcctgctggg gagcctgggg acttccaca ccctaactga cacacattcc	4200
acagctggtt cttccgcct caggactctt ccttttcaa taaatcaatc taaagtatat	4260
atagtagaaac ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga	4320
tctgtctatt tcgttcatcc atagttgcct gactcccggt cgtgtagata actacgatac	4380
gggggggctt accatctggc cccagtgctg caatgatacc gcgagaccca cgctcaccgg	4440
ctccagattt atcagcaata aaccagccag ccggaaaggcgc cgagcgcaga agtggcctg	4500
caactttatc cgccctccatc cagtctatta attttgcgg ggaagctaga gtaagtagtt	4560
cgcctttaa tagttgcgc aacgttggccatttgctac aggcattcggt gttcacgc	4620
cgtcgtttgg tatggcttca ttcaagtcgg gttcccaacg atcaaggcga gttacatgat	4680
cccccatgtt gtgcaaaaaa gcggttagct cttccgggtcc tccgatcggtt gtcagaagta	4740
agttggccgc agtggatatca ctcatggtta tggcagcact gcataattct cttactgtca	4800
tgccatccgt aagatgctt tctgtgactg gtgagactc aaccaagtca ttctgagaat	4860
agtgtatgcg ggcggcggact tgctcttgcc cggcgtaat acgggataat accgcgcac	4920
atagcagaac tttaaaatgt ctcatttcattt gaaaaacgttc ttccgggcga aaactctcaa	4980
ggatcttacc gctgttggaa tccagttcga tggtaaccac tcgtgcaccc aactgatctt	5040
cagcatctt tactttcacc agcggttctg ggtgagcaaa aacagggagg caaaatgcgg	5100
caaaaaaggaa aataaggcgc acacggaaat gttgaaatact catactcttc cttttcaat	5160
attattgttgcgatcattatcgtt gtttattgtc tcatgagcgg atacatattt gatgtat	5220
agaaaaataa acaaataagggttccggcgtccat cttcccccggaaaatgtccca cctgacgcgc	5280
cctgttagcgg cgcattaaagc gcccgggttgc tgggtggttac ggcgcggcgtg accgctacac	5340
ttggccagcgc cctagcgc cccgcttccg cttttttcccttccgc ggcacgttcg	5400

ccggcttcc ccgtcaagct ctaaatcggg ggctccctt agggttccga ttttagtgctt 5460
 tacggcacct cgacccaaa aaacttgatt agggtgatgg ttcacgttagt gggccatcgc 5520
 cctgatagac ggttttcgc ccttgacgt tggagtccac gttctttaat agtggactct 5580
 tggccaacac tggacaaca ctcacccct a tctcggtcta ttctttgtat ttataaggga 5640
 ttttgcgat ttcggcctat tggtaaaaaa atgagctgat ttaacaaaaa tttaacgcga 5700
 attttaacaa aatattaacg cttacaattt ac 5732

<210> 2
 <211> 228
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic Sequence

<400> 2

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
 1 5 10 15

Gly Ser Thr Gly Asp Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Gly Ala
 20 25 30

Gln Lys Pro Glu Val Ile Asp Ala Ser Glu Leu Thr Pro Ala Val Thr
 35 40 45

Thr Tyr Lys Leu Val Ile Asn Gly Lys Thr Leu Lys Gly Glu Thr Thr
 50 55 60

Thr Glu Ala Val Asp Ala Ala Thr Ala Glu Lys Val Phe Lys Gln Tyr
 65 70 75 80

Ala Asn Asp Asn Gly Val Asp Gly Glu Trp Thr Tyr Asp Asp Ala Thr
 85 90 95

Lys Thr Phe Thr Val Thr Glu Lys Pro Glu Val Ile Asp Ala Ser Glu
 100 105 110

Leu Thr Pro Ala Val Thr Thr Tyr Lys Leu Val Ile Asn Gly Lys Thr
 115 120 125

Leu Lys Gly Glu Thr Thr Glu Ala Val Asp Ala Ala Thr Ala Glu
 130 135 140

Lys Val Phe Lys Gln Tyr Ala Asn Asp Asn Gly Val Asp Gly Glu Trp
 145 150 155 160

Thr Tyr Asp Asp Ala Thr Lys Thr Phe Thr Val Thr Glu Ala Ala Ala
 165 170 175

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Asn Gly Ala Val Asp Gly
 180 185 190

Gln Asn Asp Thr Ser Gln Thr Ser Ser Pro Ser Ala Ser Ser Asn Ile
195 200 205

Ser Gly Gly Ile Phe Leu Phe Phe Val Ala Asn Ala Ile Ile His Leu
210 215 220

Phe Cys Phe Ser
225

```
<210> 3
<211> 6094
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Sequence
```

<400> 3
gcgcgcgtg acattgatta ttgactagtt attaatagta atcaattacg gggtcattag 60
ttcatagccc atatatggag ttccgcgtt cataacttac ggtaaatggc ccgcctggct 120
gaccgccccaa cgacccccgc ccattgacgt caataatgac gtatgttccc atagtaacgc 180
caataggac tttccattga cgtcaatggg tggactattt acggtaaact gcccaactgg 240
cagtacatca agtgtatcat atgccaagta cgccccctat tgacgtcaat gacgtaaat 300
ggcccgccctg gcattatgcc cagtagatga ccttatggga ctttcctact tggcagtaca 360
tctacgtatt agtcatcgct attaccatgg ttagtgcgggtt ttggcagtac atcaatggc 420
gtggatagcg gtttactca cggggattc caagtctcca ccccattgac gtcaatggga 480
gtttgttttgcacaaaaat caacgggact ttccaaaatg tcgtaacaac tccgccccat 540
tgacgcaaattggcggttagg cgtgtacggt gggaggtcta tataaggcaga gctctctggc 600
taactagaga acccactgct tactggctt tcgaaattaa tacgactcac tataaggaga 660
cccaagcttgc taccgggtgc gatggcaccc tgcgtctgc tcctgctgtt ggcggccgccc 720
ctggccccga ctcagaccccg cgccccggcc caaaaggaga agaccccgaa ggagcccaag 780
gaggaggtga ccatcaaggc caacctgtatc tacgcccacg gcaagaccca gaccgcccag 840
ttcaaggcaca cttcgagga ggcaccccg gaggcctacc gctacgcgaa cgcctgaag 900
aaggacaacg gcgagtacac cgtggacgtg gccgacaagg gctacaccct gaacatcaag 960
ttcgccggca aggagaagac ccccgaggag cccaaaggagg aggtgaccat caaggccaac 1020
ctgatctacg ccgacggcaa gacccagacc gccgagttca agggcacctt cgaggaggcc 1080
accgcggagg cctaccgcta cgccgacgcc ctgaaagg acaacggcga gtacaccgtg 1140
gacgtggccg acaaggcata caccctgaac atcaagttcg ccggcaagga gaagaccccc -1200
gaggagccca aggaggaggt gaccatcaag gccaacctga tctacgcgaa cggcaagacc 1260
cagaccgccc agttcaaggg cacccgtgag gaggccacccg cggaggccctt ccgctacgcc 1320
gacgccttga agaaggacaa cggcgagtac accgtggacg tggccgacaa gggctacacc 1380

ctgaacatca agttcgccgg caaggagaag acccccagg agcccaagga ggaggtgacc 1440
 atcaaggcca acctgatcta cgccgacggc aagaccaga ccgcccagtt caagggcacc 1500
 ttcgaggagg ccaccgcgg agcctaccgc tacccgacg ccctgaagaa ggacaacggc 1560
 gagtacaccg tggacgtggc cgacaaggc tacaccctga acatcaagtt cgccggcgcg 1620
 gccgcagaac aaaaactcat ctcagaagag gatctgaatg gggccgtcga cggacaaaac 1680
 gacaccagcc aaaccagcag cccctcagca tccagcaaca taagcggagg cattttcctt 1740
 ttcttcgtgg ccaatgccat aatccacctc ttctgtttca gttgaggtga cacgtctaga 1800
 gctattctat agtgcacccat aaatgctaga gctcgctgat cagccctgcac tgtgccttct 1860
 agttgccagc catctgttgt ttgcccctcc cccgtgcctt ccctgaccct ggaaggtgcc 1920
 actcccaactg tccttcctta ataaaatgag gaaattgcat cgcattgtct gagtaggtgt 1980
 cattctattc tgggggggtgg ggtggggcag gacagcaagg gggaggattg ggaagacaat 2040
 agcaggcatg ctggggatgc ggtgggtctt atggctctg aggccggaaag aaccagtggc 2100
 ggttaatacgg ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg 2160
 ccagcaaaag gccaggaacc gtaaaaaggc cgcgttgctg gcgttttcc ataggctccg 2220
 ccccccgtac gagcatcaca aaaatcgacg ctcagtcag aggtggcgaa acccgacagg 2280
 actataaaga taccaggcgt ttccccctgg aagctccctc gtgcgtctc ctgttccgac 2340
 cctgcccctt accggatacc tgtccgcctt tctccctcg ggaagcgtgg cgctttctca 2400
 tagtcacgc tgttaggtatc tcagttcggt gtaggtcggt cgctccaagc tgggctgtgt 2460
 gcacgaaccc cccgttcagc cgcggcgtc cgccttatcc ggtaactatc gtcttgagtc 2520
 caacccggta agacacgact tatgcactt ggcagcagcc actggtaaca ggatttagcag 2580
 agcgaggat gtaggcggtg ctacagatc tttgaagtgg tggcctaact acggctacac 2640
 tagaaggaca gtatggta tctgcgtct gctgaagcca gttacctcg gaaaaagagt 2700
 tggtagctct tgatccggca aacaaaccac cgctggtagc ggtggtttt ttgtttgcaa 2760
 gcagcagatt acgcgcagaa aaaaaggatc tcaagaagat cctttatct tttctacggg 2820
 gtctgacgct cagtggaacg aaaactcact ttaaggatt ttggatcatga gattatcaaa 2880
 aaggatcttc acctagatcc tttaaatatta aaaatgaagt tttaaatcaa tctaaatgt 2940
 atatgagtaa cctgaggcta tggcagggcc tgccgcccc acgtggctg cgagccctgg 3000
 gccttcaccc gaacctgggg ggtgggtgg gaaaaggaa gaaacgcggg cgtattggcc 3060
 ccaatgggt ctcgggggg tatcgacaga gtgcggccccc tgggaccgaa ccccgcttt 3120
 atgaacaaac gaccaacac cgtgcgtttt attctgtctt ttatggccg tcatagcgcg 3180
 ggttccttcc ggtattgtct cttccgtgt ttcagttgc cttcccttag ggtggggcggaa 3240
 gaactccagc atgagatccc cgcgtggag gatcatccag cggcgctccc gggaaacgat 3300
 tccgaaggccc aaccttcat agaaggcggc ggtggaaatcg aaatctcgat atggcaggtt 3360
 gggcgctcgat tggtcggta tttcaaccc cagagtcccg ctcagaagaa ctcgtcaaga 3420
 aggcgataga aggcgatgcg ctgcgaatcg ggagcggcga taccgtaaag cacgaggaag 3480

cggtcagccc attcgccgcc aagctttca gcaatatcac ggtagccaa cgctatgtcc 3540
 tgatagcggt ccgccacacc cagccggcca cagtcgatga atccagaaaa gcggccattt 3600
 tccaccatga tattcggcaa gcaggcatcg ccatgggtca cgacgagatc ctcgccgtcg 3660
 ggcgcgtcg ccttgagcct ggcgaacagt tcggctggcg cgagccccgt atgctttga 3720
 tcatacctgat cgacaagacc ggcttccatc cgagtacgtg ctcgcgtcgat gcgatgtttc 3780
 gcttgggtgt cgaatgggca ggtagccgga tcaagcgtat gcagccgccc cattgcatca 3840
 gccatgatgg atacttctc ggcaggagca aggtgagatg acaggagatc ctgccccggc 3900
 acttcgcccata tagcagcca gtcccttccc gcttcagtga caacgtcgag cacagctgcg 3960
 caaggaacgc ccgtcgtggc cagccacatg agccgcgtg cctcgtcttgc cagttcattt 4020
 agggcaccgg acaggtcggt cttgacaaaa agaaccgggc gcccctgcgc tgacagccgg 4080
 aacacggcgg catcagagca gccgattgtc tgggtgtccc agtcatagcc gaatagcctc 4140
 tccaccacaag cggccggaga acctgcgtgc aatccatctt gttcaatcat gcgaaacgat 4200
 cctcatccctg tctttgatc gatcttcgtca aaagcctagg cctccaaaaa agcctcctca 4260
 ctacttctgg aatagctcag aggccgagga ggcggccgtg gcctcgtcat aaataaaaaaa 4320
 aattagtcag ccatggggcg gagaatgggc ggaactgggc ggagtttaggg gcgggatggg 4380
 cgaggttagg ggcgggacta tgggtgtca ctaattgaga tgcgtcttgc cataacttct 4440
 gcctgctggg gagcctgggg actttccaca cttgggtgtc gactaattga gatgcgtct 4500
 ttgcataactt ctgcctgctg gggagccctgg ggactttcca caccctaaact gacacacatt 4560
 ccacagctgg ttcttccgc ctcaggactc ttcccttttc aataaatcaa tctaaagtat 4620
 atatgagtaa acttggtctg acagttacca atgcttaatc agtgaggcac ctatctcagc 4680
 gatctgtcta ttgcgttcat ccatagttgc ctgactcccc gtcgtgtaga taactacgt 4740
 acgggagggc ttaccatctg gcccagtgc tgcaatgata cccgcgagacc cacgctcacc 4800
 ggctccagat ttatcagcaa taaaccagcc agccggaaagg gccgagcgcga gaagtggtcc 4860
 tgcaacttta tccgcctcca tccagtctat taattgttgc cggaaagcta gagtaagttag 4920
 ttgcgcgtt aatagtttc gcaacgttgt tgccattgtc acaggcatcg tgggtgtcact 4980
 ctcgtcgttt ggtatggctt cattcagtc cggttccaa cgatcaaggc gagttacatg 5040
 atccccatg ttgtgcaaaa aagcggttag ctccctcggt cctccgtatcg ttgtcagaag 5100
 taagttggcc gcagtgttat cactcatgtt tatggcagca ctgcataatt ctcttactgt 5160
 catgccatcc gtaagatgct ttctgtgac tgggtgactac tcaaccaagt cattctgaga 5220
 atagtgtatc cggcgaccga gttgctttc cccggcgtca atacgggata ataccgcgc 5280
 acatagcaga accttaaaag tgctcatcat tggaaaacgt tcttcggggc gaaaactctc 5340
 aaggatcttta cgcgttgc gatccagttc gatgtaaacc acgtgtgcac ccaactgatc 5400
 ttcaatcttca ccagcgatcc tgggtgactca aaaacaggaa ggcaaaatgc 5460
 cgcaaaaaag ggaataaggg cgacacggaa atgttgcataatctc tccctttca 5520

atattattga agcatttatac agggttattg tctcatgagc ggatacatat ttgaatgtat 5580
 ttagaaaaat aaacaaatag gggttccgcg cacatccc cggaaagtgc cacctgacgc 5640
 gcccgttagc ggcgcattaa gcgcggcgg tgggtggtt acgcgcagcg tgaccgctac 5700
 acttgcgcagc gccctagcgc cgcgccttt cgcttcttc cttcccttc tcgcccacgtt 5760
 cggcggctt cccgtcaag ctctaaatcg ggggctccct ttagggttcc gatttagtgc 5820
 ttacggcac ctcgacccca aaaaacttga ttagggtgat gggtcacgta gtggggccatc 5880
 gccctgatag acggttttc gcccttgac gttggagtcc acgttctta atagtggact 5940
 ctgttccaa actggaacaa cactcaaccc tatctcggtc tattttttt atttataagg 6000
 gatttgccg atttcggcct attggtaaa aaatgagctg atttaacaaa aatttaacgc 6060
 gaatttaac aaaatattaa cgcttacaat ttac 6094

<210> 4
 <211> 367
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic Sequence

<400> 4

Met Ala Pro Cys Met Leu Leu Leu Leu Ala Ala Ala Leu Ala Pro
 1 5 10 15

Thr Gln Thr Arg Ala Gly Ala Gln Lys Glu Lys Thr Pro Glu Glu Pro
 20 25 30

Lys Glu Glu Val Thr Ile Lys Ala Asn Leu Ile Tyr Ala Asp Gly Lys
 35 40 45

Thr Gln Thr Ala Glu Phe Lys Gly Thr Phe Glu Glu Ala Thr Ala Glu
 50 55 60

Ala Tyr Arg Tyr Ala Asp Ala Leu Lys Lys Asp Asn Gly Glu Tyr Thr
 65 70 75 80

Val Asp Val Ala Asp Lys Gly Tyr Thr Leu Asn Ile Lys Phe Ala Gly
 85 90 95

Lys Glu Lys Thr Pro Glu Glu Pro Lys Glu Glu Val Thr Ile Lys Ala
 100 105 110

Asn Leu Ile Tyr Ala Asp Gly Lys Thr Gln Thr Ala Glu Phe Lys Gly
 115 120 125

Thr Phe Glu Glu Ala Thr Ala Glu Ala Tyr Arg Tyr Ala Asp Ala Leu
 130 135 140

Lys Lys Asp Asn Gly Glu Tyr Thr Val Asp Val Ala Asp Lys Gly Tyr
 145 150 155 160

Thr Leu Asn Ile Lys Phe Ala Gly Lys Glu Lys Thr Pro Glu Glu Pro
 165 170 175

Lys Glu Glu Val Thr Ile Lys Ala Asn Leu Ile Tyr Ala Asp Gly Lys
 180 185 190

Thr Gln Thr Ala Glu Phe Lys Gly Thr Phe Glu Glu Ala Thr Ala Glu
 195 200 205

Ala Tyr Arg Tyr Ala Asp Ala Leu Lys Lys Asp Asn Gly Glu Tyr Thr
 210 215 220

Val Asp Val Ala Asp Lys Gly Tyr Thr Leu Asn Ile Lys Phe Ala Gly
 225 230 235 240

Lys Glu Lys Thr Pro Glu Glu Pro Lys Glu Glu Val Thr Ile Lys Ala
 245 250 255

Asn Leu Ile Tyr Ala Asp Gly Lys Thr Gln Thr Ala Glu Phe Lys Gly
 260 265 270

Thr Phe Glu Glu Ala Thr Ala Glu Ala Tyr Arg Tyr Ala Asp Ala Leu
 275 280 285

Lys Lys Asp Asn Gly Glu Tyr Thr Val Asp Val Ala Asp Lys Gly Tyr
 290 295 300

Thr Leu Asn Ile Lys Phe Ala Gly Ala Ala Ala Glu Gln Lys Leu Ile
 305 310 315 320

Ser Glu Glu Asp Leu Asn Gly Ala Val Asp Gly Gln Asn Asp Thr Ser
 325 330 335

Gln Thr Ser Ser Pro Ser Ala Ser Ser Asn Ile Ser Gly Gly Ile Phe
 340 345 350

Leu Phe Phe Val Ala Asn Ala Ile Ile His Leu Phe Cys Phe Ser
 355 360 365

<210> 5

<211> 5729

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic Sequence

<400> 5

ggcgcgcgttg acattgatta ttgactagtt attaatacgta atcaattacg gggtcattag 60

ttccatagccc atatatggag ttccgcgtta cataacttac ggtaaatggc ccgcctggct 120

gaccgccccaa cgacccccgc ccattgacgt caataatgac gtatgttccc atagtaacgc 180

caataggac tttccattga cgtcaatggg tggactattt acggtaaact gcccacttg 240
 cagtacatca agtgtatcat atgccaagta cgcccctat tgacgtcaat gacggtaaat 300
 ggccgcctg gcattatgcc cagtacatga ctttatggg ctttcctact tggcagtaca 360
 tctacgtatt agtcatcgct attaccatgg tcatgcggtt ttggcagtac atcaatggc 420
 gtggatagcg gtttgcactca cggggatttc caagtctcca ccccattgac gtcaatggg 480
 gtttgcgggg gcaccaaaat caacgggact ttccaaaatg tcgtaacaac tccgccccat 540
 tgcgcggaaat gggcggttagg cgtgtacggg gggaggtcta tataaggcaga gctctctggc 600
 taactagaga acccactgct tactggctta tcgaaaattaa tacgactcac tataaggaga 660
 cccaaatggt gtaccgggtgc gatggcaccc tgcatgctgc tcctgctgtt ggccggcc 720
 ctggcccccga ctcagaccccg cgcggggcc caaaagcccg aggtgatcga tgccagcgg 780
 ctgaccccccgg cctgtgaccac ctacaagcta gtgatcaacg gcaagacccct gaagggcgg 840
 accaccacccg aggccgtgga cgcgcacc cgcggagaagg tggtaaaaca atacgctaat 900
 gacaacgggg tcgacggcga gtggacttac gacgacgcca ccaagacccctt caccgtgacc 960
 gagaagcccg aggtgatcga tgccagcgg ctgaccccccgg cctgtgaccac ctacaagcta 1020
 gtgatcaacg gcaagacccctt gaagggcgg accaccacccg agggccgtgga cgcgcacc 1080
 gcggagaagg tggtaaaaca atacgctaat gacaacgggg tcgacggcga gtggacttac 1140
 gacgacgcca ccaagacccctt caccgtgacc gaggccgcgg cagaacaaactt actcatctca 1200
 gaagaggatc tgaatggggc cgtcgacgaa caaaaactca tctcagaaga ggatctgaat 1260
 gctgtggcc accacacgcg ggaggtcatc gtggccac actccctgccc ctttaaggtg 1320
 gtggatct cagccatcctt ggccctgggtg gtgctcacca tcataccttctt tatacatcc 1380
 atcatgctttt ggcagaagaa gccacgttcg tcggccgatc gagaatccat ctagagctat 1440
 tctatagtgt cacctaaatg ctagagctcg ctgatcagcc tcgactgtgc cttctagtt 1500
 ccagccatctt gttttgc cctcccccgt gccttcctt accctggaaag gtggccactcc 1560
 cactgtccctt tcctaataaa atgaggaaat tgcatcgcat tgcgtgagta ggtgtcattc 1620
 tattctgggg ggtgggggtgg ggcaggacacg caagggggag gattggggaa acaatagcag 1680
 gcatgctggg gatgcgggtgg gctctatggc ttctgaggcg gaaagaacca gtggcggtaa 1740
 tacggttatc cacagaatca gggataacg cagggaaagaa catgtgagca aaaggccac 1800
 aaaaggccacg gaaccgtaaa aaggccgcgt tgctggcggtt tttccatagg ctccgcccc 1860
 ctgacgagca tcacaaaaat cgacgctcaa gtcagagggtg gcaaaaccccg acaggactat 1920
 aaagatacca ggcgtttccc cctggaaatctt ccctcgtgc ctctcctgtt ccgaccctgc 1980
 cgcttaccgg atacctgtcc gcctttctcc cttcgaaag cgtggcgctt tctcatagct 2040
 cacgctgttag gtatctcagt tcgggttagg tcgatcgctc caagctggc tggatgcacg 2100
 aaccccccgt tcaagccgac cgctgcgcct tatccggtaa ctatcgctt gatccaaacc 2160
 cggtaagaca cgaatctatcg ccactggcag cagccactgg taacaggatt agcagagcga 2220
 ggtatgttagg cggtgctaca gagttcttga agtgggtggcc taactacggc tacactagaa 2280

ggacagtatt tggtatctgc gctctgctga agccagttac ctccggaaaa agagttggta 2340
 gctcttgc tgcggcaacaa accaccgctg gtagcggtgg ttttttgg tgcggcagc 2400
 agattacgctg cagaaaaaaa ggatctcaag aagatcctt gatctttct acggggtctg 2460
 acgctcagtgc acacgaaaac tcacgttaag ggattttggt catgagatta tcaaaaagga 2520
 tcttcaccta gatccttttta aattaaaaat gaagttttaa atcaatctaa agtataatatg 2580
 agtaacctga ggctatggca gggcctgccc cccgcacgtt ggctgcgagc cctggccctt 2640
 caccgcact tgggggggtgg ggtggggaaa aggaagaaac gcggggcgtat tggcccaat 2700
 ggggtctcgg tggggatcg acagagtgc agccctggga ccgaaccccg cgtttatgaa 2760
 caaacgcaccc aacaccgtgc gttttattct gtcttttat tggcgctata gcgcgggttc 2820
 cttccggat tgcgtccctt cgtgtttcag ttagcctccc cctagggtgg gcgaagaact 2880
 ccagcatgat atccccgcgc tggaggatca tccagccggc gtcccgaaaa acgattccga 2940
 agcccaacct ttcatagaag gcggcggtgg aatcgaaatc tcgtgtggc aggttggcg 3000
 tcgcttggtc ggtcatttcg aaccccgag tcccgctcag aagaactcgt caagaaggcg 3060
 atagaaggcg atgcgtcgca aatcgggagc ggcgataccg taaagcacga ggaagcggtc 3120
 agcccattcg ccgccaagct cttcagcaat atcacggta gccaacgcgt tgcctgata 3180
 gcggccgc acaccccgcc ggccacagtc gatgaatcca gaaaagcggc cattttccac 3240
 catgatattc ggcaagcagg catcgccatg ggtcacgc acgtgcgc cgtcgccat 3300
 gtcgccttgc acgctggcga acagttcggc tggcgcgagc ccctgatgc tttgatcata 3360
 ctgatcgaca agaccggctt ccatcccgatg acgtgcgc tgcgtgcgtat gttcgcttgc 3420
 gtggtcgaat gggcaggtag ccggatcaag cgtatgcagc cgccgcattt catcaggccat 3480
 gatggatact ttctcgccag gagcaaggtag agatgacagg agatcctgccc ccggcacttc 3540
 gccaatagc agccagtc tcccgcttc agtgcacaacg tgcgacacag ctgcgcagg 3600
 aacgcccgtc gtggccagcc acgatagccg cgctgcctcg tcttcgcgtt cattcaggcc 3660
 accggacagg tcggcttgc caaaaagaac cggcgcggcc tgcgtgaca gcccggacac 3720
 ggcggcatca ggcggccga ttgtctgttgc tgcccgatca tagccgataa gcctctccac 3780
 ccaagcggcc ggagaacctg cgtgcataatcc atcttgcgttca atcatgcgaa acgatcctca 3840
 tcctgtctct tgatcgatct ttgcggatcg ctaggcctcc aaaaaaggct cctactact 3900
 tctggaaatag ctcagaggcc gaggaggccg cctcgccctc tgcataaata aaaaaaattt 3960
 gtcagccatg gggcggagaa tggcggaaac tggcggagttt tagggcgggg atggcggag 4020
 ttagggcgg gactatggtt gctgactaat tgagatgc tgcgtgcata cttctgcctg 4080
 ctggggagcc tggggactttt ccacacccgg tggctgacta attgagatgc atgcttcgc 4140
 tacattctgc tgcgtgggag cctggggact ttccacaccc taactgcac acattccaca 4200
 gctggttctt tccgcctcag gactcttcctt tttcaataa atcaatctaa agtataatatg 4260
 agtaaacttg gtctgacagt taccaatgtc taatcgtga ggcacccatc tcagcgatct 4320

gtctatTCg ttcatccata gttgcctgac tccccgtcgt gtagataact acgatacggg 4380
 agggcttacc atctggcccc agtgctgcaa tgataccgcg agacccacgc tcaccggctc 4440
 cagatttacg agcaataaaac cagccagccg gaagggccga ggcgcagaagt ggtcctgcaa 4500
 ctTTatccgc ctccatccag tctattaatt gttgcggga agctagagta agtagttcgc 4560
 cagttaatag ttgcgcAAC gttgttgcA ttgtctacagg catcgtggtg tcacgctcgt 4620
 cgttggtat ggcttcattc agtccgggtt cccaaacgatc aaggcgagtt acatgatccc 4680
 ccatgttggta caaaaaagcg gttagtcct tcggcctcc gatcgtgtc agaagtaagt 4740
 tggccgcagt gtatcactc atggttatgg cagcactgca taattctctt actgtcatgc 4800
 catccgtaaag atgctttct gtgactggtg agtactcaac caagtcattc tgagaatagt 4860
 gtatgcggcg accgagttgc ttggcccg cgtaataacg ggataataacc ggcgcacata 4920
 gcagaacttt aaaagtgcAC atcattggaa aacgttcttc gggcgaaaaa ctctcaagga 4980
 tcttaccgct gttagagatcc agttcgtatgt aaccctactcg tgaccccaac tgatcttcg 5040
 catctttac ttccaccagc gtttctgggt gagcaaaaac aggaaggcaa aatgccgcaa 5100
 aaaagggaaat aaggcgaca cggaaatgtt gaataactcat actcttcctt ttcaatatt 5160
 attgaagcat ttatcagggt tattgtctca tgagcggata cataattgaa tgtatttaga 5220
 aaaataaaaca aataggggtt ccgcgcacat ttcccccggaa agtgcacccct gacgcgcct 5280
 gtagcggcgc attaagcgcg gcgggtgtgg tggttacgcg cagcgtgacc gctacacttg 5340
 ccagcgcctt agcgcgcgt ctttcgctt tcttcccttc ctttctcgcc acgttcgcgg 5400
 gctttcccg tcaagctcta aatcgggggc tccctttagg gttccgatTT agtgccttac 5460
 ggcacctcga cccaaaaaa cttgattagg gtgatggttc acgtatggg ccattgcctt 5520
 gatagacggt tttcgcctt ttgacgttgg agtccacgtt cttaatagt ggactttgt 5580
 tccaaactgg aacaacactc aaccctatct cggcttattc tttgattta taaggattt 5640
 tgccgatttc ggcctattgg taaaaaatg agctgattta aaaaaattt aacgcgaatt 5700
 ttaacaaaat attaacgcctt acaatttac 5729

<210> 6
 <211> 250
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic Sequence

<400> 6

Met Ala Pro Cys Met Leu Leu Leu Leu Ala Ala Ala Leu Ala Pro
 1 5 10 15

Thr Gln Thr Arg Ala Gly Ala Gln Lys Pro Glu Val Ile Asp Ala Ser
 20 25 30

Glu Leu Thr Pro Ala Val Thr Thr Tyr Lys Leu Val Ile Asn Gly Lys
 35 40 45

Thr Leu Lys Gly Glu Thr Thr Glu Ala Val Asp Ala Ala Thr Ala
50 55 60

Glu Lys Val Phe Lys Gln Tyr Ala Asn Asp Asn Gly Val Asp Gly Glu
65 70 75 80

Trp Thr Tyr Asp Asp Ala Thr Lys Thr Phe Thr Val Thr Glu Lys Pro
85 90 95

Glu Val Ile Asp Ala Ser Glu Leu Thr Pro Ala Val Thr Thr Tyr Lys
100 105 110

Leu Val Ile Asn Gly Lys Thr Leu Lys Gly Glu Thr Thr Glu Ala
115 120 125

Val Asp Ala Ala Thr Ala Glu Lys Val Phe Lys Gln Tyr Ala Asn Asp
130 135 140

Asn Gly Val Asp Gly Glu Trp Thr Tyr Asp Asp Ala Thr Lys Thr Phe
145 150 155 160

Thr Val Thr Glu Ala Ala Glu Gln Lys Leu Ile Ser Glu Glu Asp
165 170 175

Leu Asn Gly Ala Val Asp Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu
180 185 190

Asn Ala Val Gly Gln Asp Thr Gln Glu Val Ile Val Val Pro His Ser
195 200 205

Leu Pro Phe Lys Val Val Ile Ser Ala Ile Leu Ala Leu Val Val
210 215 220

Leu Thr Ile Ile Ser Leu Ile Ile Leu Ile Met Leu Trp Gln Lys Lys
225 230 235 240

Pro Arg Ser Ser Ala Asp Arg Glu Ser Ile
245 250